A Study on the Moulding Sand for Green Sand Castings. (I)

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(TiO_2: about 9%) at 1400°C., and cooled in various ways respectively as follows:

A) Cooled in air.

B) Quenched in water.

C) Cooled in air after being cooled to 1150°C. from 1400°C. in furnace.

D) Quenched in water after being cooled to 1150°C. from 1400°C. in furnace.

E) Cooled to room temperature from 500°C. in furnace.

Melting duration of time was 15 minutes at 1400°C., and the other eyperimental conditions were the same as Report 4 (Bulletin of the Institute for Chemical Research, Kyoto University. vol. 23. Dec., 1950).

Titanium content in gray iron was increased to about three or four times of the original content in each experiments. The distribution, form and size of graphite in gray iron was studied microscopically and the size of graphite was classified by the methods after the A.S.T.M. Designation.

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22. A Study on the Moulding Sand for Green Sand Castings. (I)

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Four kinds of new sands for green sand castings and four kinds of old sands, used at four different foundries in Kyoto Prefecture, were tested. The object of this study is to clarify the nature of the moulding sand by means of the scientific methods of analysis of the moulding sands which have been experientially convinced by various foundrymen as the most favourable sand for green sand castings.

These analytical methods involve the chemical analysis, and determination of grain distributions, permeability, hardness, and compressive strength, but the chemical analyses were carried out regarding only the new sands.

The grain distributions and clay contents of those sands are shown in Table I. A, B, C and D denote four foundries. From these results, it is clarified that the most favourable sands used daily by different foundries have the approximately equal clay contents (about 10%) and grain distributions (about 50% between 48 and 150 mesh), regardless of the differences among four new sands. A is a copper alloy foundry and B, C and D are cast iron foundries of light and medium size castings. It should be due to the very small grain fineness that the clay content of the old sand A is very low. The same phenomena are observed on other various properties of these sands.

Table I.

	New Sands.				Old Sands.			
Mesh.	A	B	C	D	A	B	C	D
+ 6	0.0	0.0	0.2	0	0	0.6	0	0.2
+ 8	0.3	0.2	0.2	0.1	0	0.3	0.3	0.4
+ 10	0.2	0.3	0.4	0.1	0.2	0.6	0.5	0.6
+ 14	0.4	0.8	0.6	0.5	0.6	0.9	0.8	1.1
+ 20	0.4	1.6	0.7	0.4	0.7	1.3	1.1	1.9
+ 28	0.2	2.5	1.2	1.1	0.9	1.7	1.5	3.7
+ 35	0.3	3.8	1.6	1.6	1.2	2.6	2.0	3.4
+ 48	0.4	6.9	5.0	1.9	11.5	9.4	9.1	6.2
+ 65	0.6	10.2	7.8	5.8	13.8	10.4	11.2	7.1
+100	1.4	32.2	23.1	23.0	16.4	18.6	19.9	19.0
+150	2.9	23.5	27.0	20.3	7.4	16.9	18.0	18.9
+200	2.7	3.3	4.7	12.2	2.2	4.7	4.2	4.7
+270	24.0	4.6	4.8	15.6	10.0	8.1	8.0	12.8
−270 (Pan)	49.9	4·5	9.2	7.1	28.9	13.0	13.8	9.7
Clay	17.0	5.5	13.6	10.4	5.6	10.4	9.3	9.5

23. On the Device to Observe Zeeman Effect at 1 cm Wave

Isao Takahashi, Akira Okaya and *Tsuneo Hashi*

(Nozu Laboratory)

To produce 1 cm Wave, we converted 3 cm Wave from a klystron 2K25 to 1 cm Wave by the use of a silicon crystal 1N23 and other necessary components.

Our device are otherwise composed of TE_{123} sample cavity, TE_{011} 3 cm cavity wave meter, 1N26 crystal detector with mount magnet and vacuum tube circuit.

We succeeded in observing very clearly the cavity resonance in the mode curve of the klystron tube.

Thus we are prepared to observe Zeeman effect at 1 cm wave with the magnetic field intensity 5000 Gauß at most.

24. Studies on Biocatalyses. (XVI)

On the Distribution of Boron in Several Fruits

Kinsuke Kondo, Shigeki Mori and *Morikazu Kajima*

(Kondo Laboratory)

Of various fruits, the boron rich fruits such as apple, orange and tomato were